International Journal of Applied Engineering Research 2015 vol.10 N24, pages 44696-44704

Regional geo-statistical operation model of soil humus-content, acidity and structure distribution with geo-morphometric data use

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Abstract

© Research India Publications. Geo-statistical model operation of the humus maintenance in soil, soil acidity and structure distribution of the top soil horizons is carried out. Data acted as covariate pedogene (average annual temperature, average annual rainfall, types map of land use) and geo-morphometric (heights map, biases map, humidity topographical index, vertical channels network, multiple scale index of valley bottom flatness). For covariate col-linearity decrease the main components method is used. Variogram maps for all three studied soil properties showed existence of the strong space anisotropy. The regression analysis showed the existence of significant distinctions between arable soils and soils of natural pedogenesis on all three studied indexes. Regression model operation allowed to eliminate anisotropy of variograms. Variograms of oddments are adjusted on exponential model. Interpolation of soil properties is carried out by method of regression kriging. Regional maps of the humus maintenance, acidity and GMS of the top soil horizons are received. The space interpolation accuracy assessment was carried out bymeans of 10-fold cross check. For all three parameters, cross check showed low values of average absolute error (ME), high correlation between the actual and interpolated values and RMSE value there are less than selection dispersions, which in total shows high precision of soil properties interpolation. It is shown that the regional maps of soil properties distribution suitable for soil environmental monitoring can be received by combination of these field researches, landscape and climatic indexes and data on land use types.

Keywords

Geo-statistics, Humus, Kriging, Structure distribution, Water acidity